SEQUENCE LISTING

<110> Agrinomics, LLC

<120> Generation of Plants with Improved Pathogen Resistance and Drought Tolerance

<130> AG03-071C

<150> US 60/375,333
<151> 2002-04-24

<150> PCT/US03/12981
<151> 2003-04-24

<160> 18

<170> PatentIn version 3.2

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<213> Arabidopsis thaliana

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gctgtcggag ggaaaactgt agaagaagtg aagcgccact atgacattct cgtcgaggat 180

ctcatcaaca tcgagactgg tcgtgtccct ttgcccaatt acaagacctt cgaatctaac 240

tcaagaagca tcaatgactt tgacacaagg tatataacta aatatctata tatgatgctc 300

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<210> 2
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<212> PRT
<213> Arabidopsis thaliana

<400> 2

Met Ala Ser Asn Ser Arg Ser Ser Ile Ser Pro Trp Thr Phe Ser Gln
1 5 10 15

Asn Lys Met Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
20 25 30

Asp Arg Trp His Asn Val Ala Lys Ala Val Gly Gly Lys Thr Val Glu
35 40 45

```
Glu Val Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Ile Asn Ile
    50                  55                  60

Glu Thr Gly Arg Val Pro Leu Pro Asn Tyr Lys Thr Phe Glu Ser Asn
65                  70                  75                  80

Ser Arg Ser Ile Asn Asp Phe Asp Thr Arg Tyr Ile Thr Lys Tyr Leu
                85                  90                  95

Tyr Met Met Leu Ser Ile Tyr Phe Asp Asn His Ser Ser Asp Phe Glu
            100                 105                 110

Lys Phe Ser Gln Lys Val Leu Val Ser Tyr Ile Ser Leu Val
        115                 120                 125
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<210> 3
<211> 98
<212> PRT
<213> Brassica rapa

<400> 3

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Met Ala Ser Ser Ser Met Ser Ser Ser Trp Thr Ser Lys Gln Asn Lys
1               5                   10                  15

Ile Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro Asp Arg
            20                  25                  30

Trp Gln Asn Val Ala Lys Ala Val Gly Asn Lys Ser Ala Glu Glu Val
        35                  40                  45

Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Met Asn Ile Glu Gln
    50                  55                  60

Asp Leu Val Pro Leu Pro Lys Tyr Lys Thr Val Asp Val Gly Asn Lys
65                  70                  75                  80

Ser Arg Gly Ile Asn Gly Tyr Gly Leu Arg Leu Met Lys Asn Ile Glu
                85                  90                  95

Val Gln
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<210> 4
<211> 75
<212> PRT
<213> Vitis vinifera

<400> 4

Met Ala Ser Thr Ser Leu Lys Ser Ser Gly Ser Trp Thr Pro Lys Gln
1 5 10 15

Asn Lys Leu Phe Glu Lys Ala Leu Ala Leu Tyr Asp Arg Asp Thr Pro
20 25 30

Asp Arg Trp Gln Asn Val Ala Asn Ala Val Gly Gly Lys Ser Ala Glu
35 40 45

Glu Val Lys Gln His Tyr Glu Ile Leu Ile Arg Asp Leu Lys His Ile
50 55 60

Glu Ser Gly Arg Val Pro Ile Pro Asn Tyr Lys
65 70 75

<210> 5
<211> 97
<212> PRT
<213> Glycine max

<400> 5

Met Glu Ser Cys Ser Ile Ser Ala Ser Gly Ser Trp Ser Val Lys Asp
1 5 10 15

Asn Lys Ala Phe Glu Lys Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
20 25 30

Asp Arg Trp Tyr Asn Val Ala His Ala Val Gly Gly Lys Thr Pro Glu
35 40 45

Glu Val Lys Arg His Tyr Glu Leu Leu Val Gln Asp Val Lys His Ile
50 55 60

Glu Ser Gly Arg Val Pro Phe Pro Asn Tyr Lys Lys Thr Thr Ser Glu
65 70 75 80

Ser Thr Asp Gln Glu Glu Lys Arg Leu Arg Asn Leu Asn Leu Asn Leu
85 90 95

Gln

<210> 6
<211> 88
<212> PRT
<213> Solanum tuberosum

<400> 6

Met Ala Ser Ser Ser Leu Gln Ser Ser Ser Trp Thr Pro Gln Gln Asn
1 5 10 15

Lys Leu Phe Glu Arg Ala Leu Ala Gln Phe Asp Lys Asp Thr Pro Asp
20 25 30

Arg Trp Gln Asn Val Ala Arg Ala Val Gly Gly Gly Lys Ser Ala Asp
35 40 45

Glu Val Lys Arg His Tyr Glu Ile Leu Ile Glu Asp Leu Lys Arg Ile
50 55 60

Glu Ser Gly Arg Val Pro Leu Pro Thr Tyr Thr His Glu Gln Gln Arg
65 70 75 80

Leu Leu Arg Tyr Met Asn Leu His
85

<210> 7
<211> 71
<212> PRT
<213> Populus tremula

<400> 7

Met Ser Ser Ser His Gln Thr Pro Arg Asn Ser Ser Ser Ser Trp Thr
1 5 10 15

Pro Arg Glu Asn Lys Leu Phe Glu Lys Ala Leu Ala Leu Phe Asp Lys
20 25 30

Asp Thr Pro Asp Arg Trp Lys Asn Val Ala Lys Ala Val Gly Gly Val
35 40 45

Lys Ser Ala Glu Glu Val Lys Arg His Tyr Glu Ile Leu Ile Glu Asp
50 55 60

Leu Lys His Ile Glu Pro Ala
65 70

<210> 8
<211> 88
<212> PRT
<213> Lycopersicon esculentum

<400> 8

Met Ser Ser Met Ser Ser Gln His Gly Ser Ser Gly Ser Trp Thr Ala
1 5 10 15

Lys Gln Asn Lys Ala Phe Glu Lys Ala Leu Ala Val Tyr Asp Lys Glu
20 25 30

Thr Arg Asp Arg Trp Ser Asn Val Ala Lys Ala Val Gly Gly Lys Thr
35 40 45

Ala Glu Glu Val Lys Arg His Tyr Glu Ile Leu Leu Arg Asp Val Phe
50 55 60

Phe Ile Asp Asn Gly Met Val Pro Phe Pro Lys Tyr Lys Thr Thr Gly
65 70 75 80

Gly Ser His Asn Ser Thr Ser Asp
85

<210> 9
<211> 126
<212> PRT
<213> Oryza sativa

<400> 9

Met Ala Ser Ala Ala Gly Ser Lys Gln Gln Gln Ala Met Met Ser Leu
1 5 10 15

Pro Ser Ser Arg Gly Gly Gly Gly Gly Gly Trp Thr Gln Arg Gln Asn
20 25 30

Lys Gln Phe Glu Cys Ala Leu Ala Val Tyr Asp Lys Glu Thr Pro Asp
35 40 45

Arg Trp His Asn Ile Ala Arg Tyr Met Gly Gly Ala Lys Ser Ala Asp

```
    50                  55                  60

Glu Val Arg Arg His Phe Asp His Leu Val Glu Asp Val Ser Arg Ile
65                  70                  75                  80

Glu Ser Gly Arg Val Pro Phe Pro Arg Tyr Ser Ser Ser Ser Ser Ser
                85                  90                  95

Arg Gly Ala Asp Asp Gly Asn Arg Leu Leu Thr Val Phe His Leu Ser
            100                 105                 110

Ser Val Pro Arg Thr Arg Asn Ala Asn His Lys Phe Asn Thr
        115                 120                 125
```

<210> 10
<211> 236
<212> PRT
<213> Oryza sativa

<400> 10

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Met Ala Gln Gln Ala Arg Ala Gln Trp Pro Gln Lys Gln Asn Lys Leu
1               5                   10                  15

Phe Glu Gln Ala Leu Ala Val Tyr Asp Lys Glu Thr Pro Asp Arg Trp
            20                  25                  30

His Asn Ile Ala Arg Ala Val Gly Gly Gly Lys Ser Ala Glu Asp Val
        35                  40                  45

Lys Arg Tyr Tyr Glu Met Leu Glu Glu Asp Ile Lys His Ile Glu Ser
    50                  55                  60

Gly Lys Val Pro Phe Pro Ala Tyr Arg Cys Pro Ala Ala Ala Gly Tyr
65                  70                  75                  80

Gln Ala Glu Ser Arg Pro Ser Thr Ala Ala Glu Pro Ser Arg Leu Pro
                85                  90                  95

Leu Ser Asp Ser Gly Leu Ser Gly Ile Arg Pro Thr Gln Tyr Pro Pro
            100                 105                 110

Asp Gly Glu Leu Ser Pro Pro Arg His Arg Leu Arg Arg Arg Gly Asn
        115                 120                 125
```

```
Gln Pro Ile Pro Ser Tyr Lys Pro Ser Pro Ser Arg Glu Gly Ile Phe
    130                 135                 140

Tyr Trp Glu Val Val Val Ala Ala Leu Lys Ser Arg Gly Thr Gly Ala
145                 150                 155                 160

Thr Ser Thr Pro Trp Ile Arg Leu Leu Leu Pro Gly Leu Thr Val Cys
                165                 170                 175

Arg Leu Leu Gly Ser Ser Gly Cys Phe Asp Ala Trp Met Leu Ser Thr
            180                 185                 190

Ala Arg Leu Met Val Val Asn Thr Tyr Trp Met Ser Tyr Leu Thr Arg
        195                 200                 205

Ser Pro Glu Phe His Leu Asn Phe Pro His Ile Asn Leu Arg Lys Tyr
    210                 215                 220

Glu Val Val Cys Val Gln Pro Gly Phe Met Gln Glu
225                 230                 235
```

<210> 11
<211> 92
<212> PRT
<213> Arabidopsis thaliana

<400> 11

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Met Ala Ser Ser Ser Met Ser Ser Ser Ser Ser Trp Thr Ser Lys Gln
1               5                   10                  15

Asn Lys Met Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
            20                  25                  30

Asp Arg Trp Gln Asn Val Ala Lys Ala Val Gly Ser Lys Ser Ala Glu
        35                  40                  45

Glu Val Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Met Asn Ile
    50                  55                  60

Glu Gln Asp Leu Val Pro Leu Pro Lys Tyr Lys Thr Val Asp Val Gly
65                  70                  75                  80

Ser Lys Ser Arg Gly Ile Asp Asp Phe Asp Leu Arg
```

85 90

<210> 12
<211> 101
<212> PRT
<213> Arabidopsis thaliana

<400> 12

Met Ala Ser Gly Ser Met Ser Ser Tyr Gly Ser Gly Ser Trp Thr Val
1 5 10 15

Lys Gln Asn Lys Ala Phe Glu Arg Ala Leu Ala Val Tyr Asp Gln Asp
20 25 30

Thr Pro Asp Arg Trp His Asn Val Ala Arg Ala Val Gly Gly Lys Thr
35 40 45

Pro Glu Glu Ala Lys Arg Gln Tyr Asp Leu Leu Val Arg Asp Ile Glu
50 55 60

Ser Ile Glu Asn Gly His Val Pro Phe Pro Asp Tyr Lys Thr Thr Thr
65 70 75 80

Gly Asn Ser Asn Arg Gly Arg Leu Arg Asp Glu Glu Lys Arg Met Arg
85 90 95

Ser Met Lys Leu Gln
100

<210> 13
<211> 97
<212> PRT
<213> Arabidopsis thaliana

<400> 13

Met Ala Ser Ser Ser Met Ser Ser Gln Ser Ser Gly Ser Trp Thr Ala
1 5 10 15

Lys Gln Asn Lys Ala Phe Glu Gln Ala Leu Ala Thr Tyr Asp Gln Asp
20 25 30

Thr Pro Asn Arg Trp Gln Asn Val Ala Lys Val Val Gly Gly Lys Thr
35 40 45

```
Thr Glu Glu Val Lys Arg His Tyr Glu Leu Leu Val Gln Asp Ile Asn
    50                  55                  60

Ser Ile Glu Asn Gly His Val Pro Phe Pro Asn Tyr Arg Thr Ser Gly
65                  70                  75                  80

Gly Cys Thr Asn Gly Arg Leu Ser Gln Glu Glu Lys Arg Tyr Val Leu
                85                  90                  95

Ser
```

<210> 14
<211> 639
<212> PRT
<213> Arabidopsis thaliana

<400> 14

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Met Ala Ser Ser Ser Met Ser Ser Ser Ser Ser Trp Thr Ser Lys Gln
1               5                   10                  15

Asn Lys Met Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
            20                  25                  30

Asp Arg Trp Gln Asn Val Ala Lys Ala Val Gly Ser Lys Ser Ala Glu
        35                  40                  45

Glu Val Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Met Asn Ile
    50                  55                  60

Glu Gln Asp Leu Val Asn Glu Glu Tyr Glu Asn Pro Val Lys Leu Leu
65                  70                  75                  80

His Asp Val Lys Ile Ala Ile Cys Leu Arg Ile Gln Arg Asp Met Met
                85                  90                  95

Ala Lys Ile Ser Val Ala Val Leu Leu Ser Val Met Leu Leu Val Ser
            100                 105                 110

Ile Asn Ser Val Asp Ile Leu Ala Glu Glu Glu Pro Thr Val Gly Gln
        115                 120                 125

Arg Val Asp Ser Ala Met Thr Ser Val Thr Asp Ala Phe Asn Glu His
    130                 135                 140
```

```
Gly Gly Pro Gln Ala Val Asp Thr Val Ser Ser Thr Phe Lys Ser Val
145                 150                 155                 160

Tyr Gly Trp Phe Gly Asp Lys Ala Lys Tyr Leu Glu Pro Ile Ser Ser
                165                 170                 175

Ser Cys Cys Ser Ser Ser Ser Ser Ser Ser Gly Glu Glu Asn Thr Ala
            180                 185                 190

Ala Ala Asn Met Thr Glu Met Glu Ala Ala Glu Ala Leu Ala Asp Leu
        195                 200                 205

Ala Gln Leu Ala Ile Met Arg Glu Gln Val Phe Glu Ser Ala Ala Ser
    210                 215                 220

Trp Gly Ser Lys Gly Lys Arg Val Arg Lys Arg Val Lys Thr Glu Ser
225                 230                 235                 240

Pro Pro Ser Asp Ser Leu Leu Lys Pro Pro Asp Ser Asp Thr Leu Pro
                245                 250                 255

Thr Pro Asp Leu Ala Glu Glu Arg Leu Val Lys Glu Glu Glu Glu Glu
            260                 265                 270

Glu Glu Val Glu Pro Ile Thr Lys Glu Leu Thr Lys Ala Pro Val Lys
        275                 280                 285

Ser Glu Ile Asn Gly Glu Thr Pro Lys Pro Ile Leu Ala Ser Thr Leu
    290                 295                 300

Ile Arg Cys Ser Arg Ser Asn Gly Cys Gly Arg Ser Arg Gln Asn Leu
305                 310                 315                 320

Ser Glu Ala Glu Arg Glu Glu Arg Arg Ile Arg Arg Ile Leu Ala Asn
                325                 330                 335

Arg Glu Ser Ala Arg Gln Thr Ile Arg Arg Arg Gln Ala Met Cys Glu
            340                 345                 350

Glu Leu Ser Lys Lys Ala Ala Asp Leu Thr Tyr Glu Asn Glu Asn Leu
        355                 360                 365
```

```
Arg Arg Glu Lys Asp Trp Ala Leu Lys Glu Phe Gln Ser Leu Glu Thr
    370                 375                 380

Ile Asn Lys His Leu Lys Glu Gln Val Leu Lys Ser Val Lys Pro Asp
385                 390                 395                 400

Thr Lys Glu Pro Glu Glu Ser Pro Lys Pro Ser Gln Val Glu Met Ser
                405                 410                 415

Thr Ser Ser Thr Pro Phe Tyr Phe Tyr Asn Gln Asn Pro Tyr Gln Leu
            420                 425                 430

Phe Cys Trp Pro His Val Thr Gln Ser Ser Asn Pro Met Ile Ser Pro
        435                 440                 445

Leu Glu Phe Pro Thr Ser Gly Gly Ala Ser Ala Lys Thr Ile Thr Thr
    450                 455                 460

Gln Glu His Glu Asn Ala Ala Asp Asp Asn Gly Gln Lys Thr His Phe
465                 470                 475                 480

Tyr Val Val Pro Cys Pro Trp Phe Leu Pro Pro Pro Asp His Ser Asn
                485                 490                 495

Gly Val Pro Phe Gly Leu Gln Asp Thr Gln Arg Gly Thr Phe Ser Asn
            500                 505                 510

Gly His His Ile Asp Asp Ser Ser Ala Arg Pro Met Asp Val Thr Glu
        515                 520                 525

Thr Pro Arg Ser His Leu Pro Thr Arg Ile Lys Glu Glu Asp Ser Gly
    530                 535                 540

Ser Pro Glu Thr Arg Pro Leu Tyr Asp Leu Asn Glu Ser Ala Thr Glu
545                 550                 555                 560

Val Leu Ser Glu Gly Gly Asp Gly Phe Pro Val Thr Gln Gln Ala Tyr
                565                 570                 575

Ser Leu Lys His Glu Asp Val Ser Glu Thr Thr Asn Gly Val Thr Leu
            580                 585                 590
```

```
Met Pro Pro Gly His His Val Leu Ile Ser Leu Pro Glu Lys Lys His
        595                 600                 605

Gly Ser Leu Ala Ala Ala Glu Ala Arg Lys Arg Arg Lys Glu Leu Thr
    610                 615                 620

Arg Leu Lys Asn Leu His Gly Arg Gln Cys Arg Met Gln Val Gly
625                 630                 635
```

<210> 15
<211> 90
<212> PRT
<213> Oryza sativa

<400> 15

```
Met Ala Ser Met Ser Val Ser Ser Ser Arg Ala Pro Gln Trp Thr Ala
1               5                   10                  15

Arg Gln Asn Glu Gln Phe Glu Arg Ala Leu Ala Val Tyr Asp Arg Asp
            20                  25                  30

Thr Pro Glu Arg Trp His Asn Ile Ala Arg Ala Val Ala Gly Lys Ser
        35                  40                  45

Ala Asp Glu Val Lys Leu Tyr Tyr Asp Leu Leu Val Glu Asp Val Lys
    50                  55                  60

Arg Ile Glu Thr Gly Lys Val Pro Phe Pro Ala Tyr Arg Cys Pro Gln
65                  70                  75                  80

Pro Ala Ile Ala Glu Asn Ser Gly Ile Trp
                85                  90
```

<210> 16
<211> 101
<212> PRT
<213> Oryza sativa

<400> 16

```
Met Ser Ser Ser Trp Thr Thr Lys Gln Asn Lys Val Phe Glu Arg Ala
1               5                   10                  15

Leu Ala Ile Tyr Asp Arg Asp Thr Pro Asp Arg Trp Gln Asn Val Ala
            20                  25                  30
```

```
Arg Ala Val Gly Gly Gly Lys Ser Val Asp Asp Val Lys Arg His Tyr
        35                  40                  45

Glu Lys Leu Ile Lys Asp Val Asp Arg Ile Asp Ser Thr Gly Gly His
    50                  55                  60

Gln Gly Ser His Tyr Asn Ser Ser Asn Ala Ser Ser Ser Ser Ser Ser
65                  70                  75                  80

Ser Ser Ser Asn Ser Arg Gly Ser Ala Asn Glu Asp Gln Arg Arg Arg
                85                  90                  95

Tyr His Asn Phe Gln
            100
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<210> 17
<211> 97
<212> PRT
<213> Lycopersicon esculentum

<220>
<221> misc_feature
<222> (93)..(93)
<223> Xaa can be any naturally occurring amino acid

<400> 17

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Gln Lys Ile Ile Met Ser Ser Met Ser Ser Gln His Gly Ser Ser Gly
1               5                   10                  15

Ser Trp Thr Ala Lys Gln Asn Lys Ala Phe Glu Lys Ala Leu Ala Val
            20                  25                  30

Tyr Asp Lys Glu Thr Arg Asp Arg Trp Ser Asn Val Ala Lys Ala Val
        35                  40                  45

Gly Gly Lys Thr Ala Glu Glu Val Lys Arg His Tyr Glu Ile Leu Leu
    50                  55                  60

Arg Asp Val Phe Phe Ile Asp Asn Gly Met Val Pro Phe Pro Lys Tyr
65                  70                  75                  80

Lys Thr Thr Gly Gly Ser His Asn Ser Thr Ser Asp Xaa His Tyr Phe
                85                  90                  95
```

Tyr

<210> 18
<211> 732
<212> DNA
<213> Solanum tuberosum

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tgaaagggca ctagctcaat tcgataagga cacacctgac cggtggcaga atgtggcgcg 120

ggcggttgga ggtggaaaat ccgccgatga agtaaagaga cactatgaaa tacttattga 180

ggatctcagg cgcattgaat ctggacgtgt tcctcttcct acttacaccc atgaacaaca 240

aaggtattct taatcattct ctttaagtct tttgtccgtt attatttaaa attacaacat 300

tcaaaagttc tttcaaattc aattggatgg agtgaataaa tatgatattt tttgtttcaa 360

aggaatagca aagtatatat actttgatct tgaacatttt gaaatgtgaa atgagacggt 420

tccatactta aaccctactt tactagtcta tacttttgaa tgagacagtt acatatttct 480

aacttttgtc tatttgtaaa acataagaaa tattcttatc ttttttagaa ttcagttaat 540

attttctttt caacctttttg ttgtatttta gtcgattcga gtcatgcaaa cagttcggat 600

atgaatgaaa tttagaaatc ttaaatttca taaattaaca aaacagacat ggtgcggtgt 660

ttgaaagtta ttgcatgtaa ccctataccc tattctaatt aagagtcctt aaatctttat 720

tagtatcttt tt 732